1969 Suggested Fungicide Guide

Fungicide Guide for COMMERCIAL VEGETABLE GROWERS

Vegetable fungicide tolerances and intervals approved by the Food and Drug Administration and the U.S. Department of Agriculture as of January 1, 1969 are presented in this publication. The tables on pages 2 and 3 give the tolerances in parts per million (ppm) and the number of days between the last application at normal rate and the harvest *or* they give the date of last application that will keep residues within tolerances set by the FDA. The listing of a chemical for a crop does not necessarily constitute recommendation for control of a disease on that crop by the Illinois Cooperative Extension Service and the Agricultural Experiment Station. Specific recommendations are given on pages 4 to 7.

In some instances a tolerance (ppm) has been set but a definite interval has not been established. The absence of an interval does not necessarily mean that the fungicide may not be used on that crop. Use of the fungicide would require such restrictions as "do not apply after first blooms appear" or "do not apply after edible parts form."

In a few cases the interval and dosage have been established, but the allowable ppm residue has not been determined. Here again this does not mean that the fungicide may not be used on that crop. It does mean, however, that until a tolerance is established it must be considered to be zero. Zero tolerances are reviewed each year. Some are cancelled as the manufacturer supplies the USDA with additional data.

Growers must follow a disease control program that will assure the production of vegetables with no excessive fungicide residues. Vegetables marketed with residues exceeding FDA tolerances may be injurious to consumers, may be confiscated, and may cause the grower to be brought to court.

Growers have nothing to fear from the law so long as they use fungicides and other pesticides according to the current label only on the *crops specified,* in the *amounts specified,* and at the *times specified.* The safe grower keeps a record of the products and trade names used, the percentage of active ingredients, dilutions, rates of application per acre, and dates of application. The record sheet provided on page 8 is a convenient place to keep such information.

This circular will be revised each year. Be sure you have the most up-to-date copy.

For additional information, read Report on Plant Diseases No. 1,000 (revised), "Fungicide, Nematocide, and Preservative Tolerances and Use Restrictions Approved by the USDA as of January 1, 1969." It is available in all county extension offices.

Prepared by Malcolm C. Shurtleff, M. B. Linn, and Edward E. Burns, Department of Plant Pathology

UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN / COLLEGE OF AGRICULTURE / COOPERATIVE EXTENSION SERVICE
Urbana, Illinois Circular 999 March, 1969
Cooperative Extension Work, University of Illinois at Urbana-Champaign College of Agriculture and the U.S. Department of Agriculture cooperating.
JOHN B. CLAAR, *Director*. Acts approved by Congress May 8 and June 30, 1914.

FUNGICIDE USES FOR VEGETABLES, APPROVED BY USDA, JANUARY 1, 1969[a]

Crop	FDA-permitted tolerance							
	Captan, 100 ppm	Dyrene, 10 ppm	Ferbam, 7 ppm	Folpet, 50 ppm	Maneb, 7 or 10 ppm	Maneb and zinc ion[b] (See ppm below)	Zineb, 7 or 25 ppm	Ziram, 7 ppm
Asparagus	root dip	..	..	..	A[c]	(10 ppm), ph[c]	ph	..
Beans (dry, lima, snap)	0[d], pp[c]	..	4[d], B[c]	..	4[d]	..	7[d], pp	4[d](snap)
Beet, garden	0, pp	..	..	..	..	..	7 (tops)	7 (tops)
Broccoli	pp	..	plant bed	..	3 or trim and wash	..	7	7
Brussels sprouts	pp	..	..	..	0	..	7	0
Cabbage	pp	..	plant bed	..	7	..	7	0
Cantaloupe (muskmelon)	0, ph, pp	0	0	0	0	..	0	0
Carrot	0 (roots)	..	7 (tops)	..	0	(2 ppm), 7[d], B (tops)	7 (tops)	7 (tops)
Cauliflower	pp	..	..	..	0	..	7	7
Celery	0, pp	0 (strip and wash)	0 (strip and wash)	7	0 (strip and wash)	(10 ppm), 7	0 (strip and wash)	0 (strip and wash)
Chinese cabbage	..	..	..	..	..	..	7	..
Corn, sweet and pop	10, B, pp	..	..	..	0, B	..	0, B	..
Cucumber	0, ph	0	0	0	0	(7 ppm), 0	0	0
Eggplant	0, pp	..	..	..	0	..	0	0
Endive, escarole	..	..	..	..	7 and wash	..	7	..
Kale, collard	pp	..	..	..	..	..	7	0
Kohlrabi	pp	..	..	..	0	..	half grown	7
Lettuce	0, pp	..	plant bed	0	7 (strip and wash)	..	5 (head); 7 (leaf)	..
Mustard green	..	..	..	..	..	..	7	..
Onion	0, ph	0 (dry)	..	0	0	7 (dry)	7 (green)	0 (dry)
Pea	pp	..	..	..	..	..	7, pp	7
Pepper	0, pp	..	plant bed	..	0	(10 ppm) until fruit buds form	0	0
Potato, Irish[e]	0, ph	0 (1 ppm)	0	0	0, (0.1 ppm)	(10 ppm) 0, B	0 and seed piece dip	0
Potato, sweet[e]	..	..	vine cutting dip	..	..	..	..	..
Pumpkin	0	0	..	0	0	(10 ppm) until edible parts show	0	0
Radish	..	..	..	..	..	..	0	0
Rhubarb	0	..	..	..	0	..	0	0
Spinach	0, pp	..	..	..	7 and wash	..	7	0
Squash	0	0	0	0	0	(7 ppm), 0-summer	0	0
Sugar beet[e]	..	..	..	..	10 (45 ppm), B	(65 ppm-tops) 14 (2 ppm-roots) 10, B	30, B	..
Swiss chard	..	..	..	..	..	..	7	..
Tomato	0, pp	0	0	0	0	..	0	0
Turnip, rutabaga	pp	..	0	..	..	..	0 (roots), 7 tops	0
Watermelon	0	0	0	0	0	0 ppm in edible parts	0	0

---

[a] No tolerances have been set for these fungicides on dill, horseradish, okra, parsley, and parsnip.

[b] Maneb and zinc ion is sold as Dithane M-45 and Manzate 200.

[c] The following abbreviations are used:

A = Post-harvest application to ferns only or to young plantings that will not be harvested.
B = Do *not* feed treated tops or forage to dairy animals or animals being finished for slaughter.
ph = Cleared for use as a post-harvest dip at 0.12 percent (0.25 percent for captan on cantaloupe and cucumber).
pp = Cleared for use as a preplanting soil treatment only.
ppm = parts per million.

[d] Number indicates number of days between last application and harvest; 0 = up to harvest. (Numbers in parentheses refer to ppm.)

[e] Tolerances are not needed for pesticides applied *only* to the foliage and not translocated to the tubers or roots.

LABEL INFORMATION ON FUNGICIDES OF LESS GENERAL USE

Fungicide (tolerance)	Crops and use restrictions
Copper, fixed, neutral, and basic (including Bordeaux mixture)	Exempt if used in accordance with good agricultural practices. Not exempt if used at time of or after harvest. See label.
Diammonium ethylene bisdithiocarbamate (Amobam) (7 or 25 ppm[a] as Zineb)	**Celery, Corn** — to harvest; **Onion, Potato, Pumpkin, Spinach, Squash, Tomato** — 7 days[b]; **Lettuce, Pepper** — plant bed soil drench.
DCNB (Botran)	**Greenhouse tomato** — to harvest; **Carrot, Sweet potato** — post-harvest dip or spray, see label; **Garlic, Onion** — soil application before seeding or spray to soil around sets or bulbs. **Leaf lettuce (greenhouse)** — 14 days (do not apply to wilted plants or seedlings). **Celery** — 7 days; **Cucumber** (greenhouse) — see label; **Rhubarb** (greenhouse) — 3 days.
Dexon	Cleared *only* for seed-treatment use on **Beans, Beets, Corn, Cucumbers, Peas.** In-furrow treatment at time of planting for **Sugar beets.**
Dichlone (Phygon) (3 ppm)	**Beans** — 7 days; **Cabbage** — 28 days after setting (combined with 30% sulfur); **Celery, Potato** (foliage), **Tomato, Watermelon** — to harvest; **Potato** — seed piece dip; **Tomato** — plant bed treatment; **Sweet potato** — postharvest to potatoes before storage and sprout dip before planting. **Corn, Peas** — seed treatment only. Do *not* use treated seed for food or feed.
Difolatan (Folcid)	**Potato** — no-residue basis; no limitations on time before harvest is required. **Corn** — seed treatment only. Do *not* use for food or feed, or with oil.
Dinocap (Karathane, Mildex)	**Cantaloupe (Muskmelon), Cucumber, Honeydew melon, Pumpkin, Squash, Watermelon** — 7 days.
Hexachlorophene (Nabac) (0 ppm)	**Potato** — to harvest; **Cucumber** — 3 days; **Pepper, Tomato** — 5 days; **Beans, Cabbage, Celery, Watermelon** — drench in seed-row areas until seedling plants are established. (Do *not* feed treated foliage to livestock.)
Nabam, 18-20% liquid	Used *with* iron, manganese, or zinc salts the tolerances for ferbam, maneb, or zineb apply. When used *without* iron, manganese, or zinc salts, use to harvest on **Beans, Cabbage, Cantaloupe (Muskmelon), Celery, Cucumber, Cucurbit, Eggplant, Pepper, Squash, Tomato, Watermelon. Onion** — seed treatment or soil treatment at time of planting. **Potato** — seed piece dip. Plant immediately after drying.
Nabam, 93% WP[a] (Dithane A-40)	Used *with* iron, manganese, or zinc salts the tolerances for ferbam, maneb, or zineb apply.
Oxyquinoline sulfate (Fulex A-D-O, Wilson's Anti-Damp, Sunox)	Soil treatment. Preplanting or as seedlings emerge. (1 oz. of 67.5% solution in 20 gallons of water. Apply 1 qt. per sq. ft.)
Polyethylene polymer (Polyram) (0 ppm)	**Cantaloupe, Celery, Cucumber, Potato, Sugar beet, Tomato** — no time limitations; **Potato** — seed piece treatment. Do *not* feed **Sugar beet** tops to meat or dairy animals; **Celery** — remove excess residues by stripping, trimming, and washing.
PCNB (Terraclor, Brassicol, Fungiclor) (0 ppm)	**Beans** — base of plants *before* blossoming, soil and seed treatment at planting, or foliar spray. Do *not* feed treated **Bean** vines to livestock. **Broccoli, Brussels sprouts, Cabbage, Cauliflower** — transplant solution (½ to ¾ pint per plant) or row treatment before transplanting; **Lettuce** (head) — band treatment when plants are 2 to 3 inches tall, and then 10 and 20 days later; **Pepper, Potato, Tomato** — soil treatment at or before planting; **Tomato** (greenhouse) — transplant solution (½ pt. of 0.2% per plant).
Sodium dimethyldithiocarbamate (Sodam)	Used with ferric or zinc sulfate. See Ferbam or Ziram.
Streptomycin (alone or with 1.5% oxytetracycline) (0 ppm)	**Cucumber, Pepper, Tomato** — *before* fruits appear; **Beans** — before pods appear on table beans or on seed crop (do *not* feed treated **Bean** vines to livestock); **Celery, Peppers, Tomato** — plant beds only; **Potato** — seed piece dip or dust.
Sulfur, lime, and lime-sulfur	Exempt when used in accordance with good agricultural practices. *Caution* — these fungicides are often combined with other pesticides that may not be exempt from tolerance restrictions. See label.
Thiram, TMTD (7 ppm)	**Tomato** — to harvest; **Onion** — Furrow treatment; **Celery** — 7 days (strip, trim, and wash); **Sweet potato** — preplant root dip. Seed treatment: **Beans, Corn, Okra, Onion** (bulb and set), **Peanut.** (*Warning:* Do *not* use treated seed for food or feed, or with oil.)
Zinc dimethyldithiocarbamate-mercaptothiazole (mixture)	**Potato** — to harvest; **Tomato** — 5 days.

---

[a] ppm = parts per million; WP = wettable powder.

[b] Number of days between last application and harvest.

CONDENSED FUNGICIDE RECOMMENDATIONS FOR DISEASES OF COMMERCIAL VEGETABLE CROPS FOR 1969

Vegetable	Diseases	Fungicide (lb./A.)[a]	Remarks
Asparagus	Rust (RPD934)[b], leaf and branchlet blights	Zineb, maneb, maneb and zinc ion, or Polyram (2-3 lb./A.)	Apply to non-harvested fields *throughout* season to August 15; to harvested fields *after* cutting only. Apply at 7- to 10-day intervals. May combine with insecticides to control asparagus beetles, cutworms, etc. (Cir. 897)[b].
Beans (garden, wax, and lima)	Seed decay (RPD915), damping-off, and seed-borne stem blights and root rots	Thiram or captan *plus* insecticide (e.g., dieldrin or lindane)	Treat seed any time if not previously treated by producer. Plant *only certified*, western-grown seed in warm soil above 65° F.
	Rust, anthracnose, fungus leaf spots, pod and stem spots	Maneb or zineb (2-3 lb./A.)	Apply at 7- to 10-day intervals during moist weather. Combine with insecticides to control bean beetles, aphids, leafhoppers, blister beetles, etc. (Cir. 897).
	Mosaics		Use insecticides to control aphids (NHE-47)[b] that transmit the viruses. Kill aphids *before* they feed (Cir. 897). Control weeds in and around fields (Cir. 907).
	White mold	PCNB 20 (20 lb./A.) or PCNB 75 (5 lb./A.)	Apply to base of plants just before bloom. Do not feed treated vines to livestock.
Beets (garden and sugar), Mangel, Mangold, Spinach, Swiss chard, New Zealand spinach	Seed rot (RPD915), damping-off, and seed-borne leaf spot and anthracnose	Thiram, captan, or dichlone	Treat seed any time or buy treated seed. To control damping-off apply captan (5-7 lb. of 50% WP in 25-30 gal. water/A. or 25-30 lb. of 10% dust/A. in furrow at planting time.
	Cercospora leaf spot (RPD951), downy mildew	Maneb, Polyram, or zineb (2-3 lb./A.) or fixed copper (2-3 lb. metallic/A.)	Apply every 1 to 2 weeks during rainy periods. May combine with insecticides to control aphids, leafhoppers, caterpillars, leaf miners, etc. (Cir. 897).
	Mosaics, virus yellows		Use insecticides to control aphids (NHE-47) and plant bugs that transmit the viruses. Kill insects before they feed (Cir. 897).
Broccoli, Brussels sprouts, Cauliflower, Cabbage, Chinese cabbage, Collard, Horseradish, Mustard, Kale, Kohlrabi, Radish, Rutabaga, Peppergrass, Watercress	Seed rot (RPD915), damping-off, black rot (RPD924), blackleg (RPD955), radish black root (RPD948), alternaria blight	Hot water, then thiram or captan	Buy western-grown seed. Sow *only* seed treated with hot water. Control cabbage root maggots, cutworms, cabbage worms, etc. (Cir. 897). Four-year rotation with non-crucifer crops.
	Wirestem (*Rhizoctonia*) (RPD902), damping-off, seed rot (RPD916), botrytis blight (RPD942)	PCNB-captan mixture	Dust or spray on soil just before, at, or after planting seed. Follow manufacturer's directions.
	Clubroot (RPD923)	PCNB 75 or Daconil 2787 (3 lb./50 gal.)	Apply in transplant water or starter solution, ½ to ¾ pt. per plant (about 400 to 600 gal./A.).
	Downy mildew, leaf spots, white rust (RPD960), anthracnose, botrytis blight (RPD942)	Maneb or zineb (2-3 lb./A.)	Apply at 5- to 7-day intervals (3-5 days for radish) in wet weather. Use maneb in seedbed (2 lb./100 gal.). Good coverage important. May need spreader-sticker. May combine with insecticides to control aphids, cabbage worms, etc. (Cir. 897).
	Mosiacs, black ringspot		Use insecticides to control aphids (NHE-47) and cabbage worms (NHE-45) that transmit the viruses. Kill insects *before* they feed — especially in seedbeds (Cir. 897).
	Brittle root or curly-top (primarily horseradish)		Use insecticides to control leafhoppers that transmit the virus (Cir. 897). Apply when leafhoppers are *first* noticed. Additional applications may be necessary if infestation is severe.
Carrot, Parsnip	Seed rot (RPD915), damping-off	Thiram, captan, or dichlone	Treat seed any time. May combine with insecticides.
	Aster yellows (RPD903)		Use insecticides to kill leafhoppers that transmit the virus, *before* they feed (Cir. 897). Begin when plants are 2-3 inches tall; apply weekly for 4 weeks. Control weeds in and around plantings (Cir. 907).
	Cercospora leaf spot, alternaria leaf blight (RPD938)	Maneb or zineb (2-3 lb./A.)	Apply at 5- to 10-day intervals in rainy periods. Thorough coverage essential. Start around June 15.

---

[a] Dosages: The quantity of material listed is the pounds of active (actual) ingredient to be applied to 1 acre unless stated otherwise (i.e., 3 lb./A.; 2 lb. 50% WP; 20 lb. 5% dust). Abbreviations used: A = acre; WP = wettable powder; pt. = pint(s); gal. = gallon(s); T. = tablespoon(s) (level); sq. ft. = square foot or feet.

[b] RPD = Report on Plant Diseases; NHE = Natural History Entomology publication. General references: Illinois Circular 802 (revised), Vegetable Diseases; Circular 893, Soil Disinfestation Methods and Materials; Circular 897, Insect Control for Commercial Vegetable Crops and Greenhouse Vegetables; and Circular 907, Herbicide Guide for Commercial Vegetable Growers. Materials available in County Extension Offices.

CONDENSED FUNGICIDE RECOMMENDATIONS (continued)

Vegetable	Diseases	Fungicide (lb./A.)	Remarks
	Gray mold (RPD942), downy mildew, other fungus leaf spots, white rust	Maneb or zineb (2-3 lb./A.)	Apply at 5- to 7-day intervals in cool, damp weather. Do *not* apply within 10 days of harvest. May combine with insecticides to control aphids, leafhoppers, flea beetles, etc. (Cir. 897).
Okra	Seed rot (RPD915), damping-off	Thiram, captan, or dichlone	Seed treatment. Apply any time.
Onion, Garlic	Smut (RPD933), seed decay (RPD915), damping-off, seed-borne purple blotch	Thiram or captan	Apply to seed any time (RPD933). For *onion sets*, use 1 lb. (100% active) to 20 lb. seed; for *bulb onions*, wet seed with Methocel sticker then treat with 8 lb. thiram 75 or captan 75 to 8 lb. seed. For *pickling and green bunching onions*, same as for bulb onions; but use half dosage. Control seed- and bulb-feeding insects (Cir. 897).
	Blast (RPD931), downy mildew, purple blotch, gray mold blight (RPD942), neck rot (RPD930)	Maneb, maneb and zinc ion, zineb, or Dyrene (1½-3 lb./A.) plus spreader-sticker	Apply every 5 to 7 days in moist weather. May combine with insecticides to control thrips, onion maggots, cutworms, etc. (Cir. 897).
	Yellow dwarf, mosaics		Use insecticides to control aphids (NHE-47) that transmit the viruses. Kill aphids *before* they feed (Cir. 897). Keep new and old plantings *as far apart* as possible.
Pea, Lentil	Seed decay (RPD915), damping-off, seed-borne foot rots, ascochyta and mycosphaerella blights (RPD945), fusarium wilts (RPD912), and bacterial blights	Thiram, captan or dichlone *plus* insecticide (e.g., dieldrin or lindane)	Treat seed any time or buy seed treated with fungicide-insecticide. Sow certified, western-grown seed. Where captan or thiram are used, friction may reduce seeding rate; add graphite (1 oz./bu.).
	Leaf and stem spots or blights (RPD945)	Zineb or ziram (2 lb./A.)	Apply weekly in rainy weather where diseases have been severe in past.
	Mosaics (RPD947), streaks, stunt, mottle, wilt		Use insecticides to control aphids (NHE-47) and other insects that transmit the viruses. Kill insects *before* they feed (Cir. 897). Also treat field borders.
	Powdery mildew	Karathane WD or Mildex (5-8 oz./100 gal.) or sulfur-lime dust (4-6 ratio) 30 lb./A.	Do not apply at air temperature above 80° F. or when plants are in flower. Two applications, a week apart, when mildew *first* appears, should be sufficient.
Peanut	Seed rot (RPD915), seedling blights	Thiram, difolatan, or captan	Treat seed anytime.
Potato, Irish	Seed-piece decays (RPD915), and seed-borne verticillium wilt (RPD950)	Captan, thiram, maneb, dichlone, Polyram, zineb or difolatan	Apply as dust or dip to cut and uncut tubers. Follow manufacturer's directions. Tubers should be well corked over. Plant in warm (over 50° F.) soil.
	Blackleg (RPD943)	Streptomycin	May combine with treatment for seed-piece decays. Use uncut, B-size, certified seed.
	Early blight (RPD935), late blight (RPD936), and minor leaf spots and blights	Maneb, maneb and zinc ion, difolatan, or Polyram (2-3 lb./A.)	Apply at 4- to 10-day intervals. If rainy, shorten interval; if dry, lengthen. For "finish-up" sprays use fixed copper (3 lb. metallic/A.). May combine with insecticides (Cir. 897).
	Common scab (RPD909), and black scurf (*Rhizoctonia*)	PCNB (various formulations)	May help on *mineral* soils. Work into top 4-6 inches of soil at or before planting. Follow manufacturer's directions carefully.
	Mosaics, leafroll, mottle, purple-top, yellow dwarf, etc.		Use insecticides to control aphids (NHE-47), leafhoppers (NHE-22), etc., that transmit the viruses. Kill insects *before* they feed (Cir. 897).
Rhubarb	Root and crown rots	Fixed copper (3 lb. metallic/A.)	Drench crowns early in spring and after harvest. Plant *only* in *well-drained* soil.
	Leaf and stalk spots, anthracnose	Thiram, maneb, fixed copper or captan (2-3 lb./A.)	Avoid applications from 2 weeks before harvest until cutting is completed. May combine with insecticides (Cir. 897).
	Mosaics, ringspots		Use insecticides to control aphids (NHE-47) that transmit the viruses. Kill aphids *before* they feed (Cir. 897).
Sweet potato	Black rot (RPD953), fusarium wilt (RPD954), scurf (RPD957)	Mercuric chloride, Semesan Bel, or phenyl mercury	Dip disease-free roots or sprouts just before planting. Follow manufacturer's directions. Seedbed disinfestation (Cir. 893). Three- to 4-year rotation. Strict sanitation.

CONDENSED FUNGICIDE RECOMMENDATIONS (concluded)

Vegetable	Diseases	Fungicide (lb./A.)	Remarks
	Fusarium wilt (RPD954), foot rot (RPD958), scurf (RPD957)	Same as for black rot or use zineb, thiram, or ziram (1½ oz./gal.)	Dip roots and base of sprouts just before planting. Do *not* rinse after treatment. Seedbed disinfestation (Cir. 893). Four- to 5-year rotation. Strict sanitation in seedbed and field.
	Storage rots (RPD952)	Botran (as post-harvest dip or in wash water)	Helps reduce transit and market losses caused by rhizopus soft rot and black rot.
Tomato, Pepper	Seed decay (RPD915), seed-borne bacterial spot (RPD910), speck, and canker, early blight (RPD908), septoria blight, anthracnose, fusarium wilt (RPD929), leaf mold (RPD941)	Hot water then captan or thiram	Treat seed, buy treated seed, or certified, disease-free transplants (Cir. 912).
	Bacterial spot (RPD910)	Fixed copper-streptomycin mixture	Start when seedlings emerge and apply every 5 days. In *field*, use fixed copper (2-3 lb. metallic/A.) plus maneb or maneb and zinc ion (2 lb./A.).
	Damping-off (RPD916) and seedling blights, collar rot (RPD908)	Captan-PCNB mixture	Dust or spray in seedbed. Apply as plants emerge so spray runs down stems. Repeat every 4 to 7 days until 10 days before transplanting. Follow the manufacturer's directions.
	Septoria blight (RPD908), early blight, anthracnose, late blight (RPD913) and buckeye rot, gray leaf spot, leaf mold (RPD941)	Maneb, maneb and zinc ion, Polyram, or zineb (2½-4 lb./A.)	Apply every 7 to 10 days *after* first fruit clusters form. Five or more sprays may be necessary, depending on weather. Combine with insecticides to control flea beetles, climbing cutworms, hornworms, fruit flies, etc. (Cir. 897). *Soil surface spray of maneb after last cultivation improves anthracnose control.*
	Mosaics (RPD917)		Use insecticides to control aphids (NHE-47) and beetles that transmit the viruses. Kill insects *before* they feed (Cir. 897). Control weeds in and around plant-growing area (Cir. 907). Set out certified, virus-free transplants or start with virus-free seed.
	Blossom-end rot (RDP906)	Calcium nitrate (4-6 lb./A.)	Application of 4 or more consecutive sprays in the regular schedule may reduce losses. Start when fruits are the size of grapes. Irrigate to maintain uniform soil moisture.
	Cloudy spot (RPD914)		Use insecticides to control stink bugs that produce cloudy spot by feeding punctures (Cir. 897).
(General diseases that attack most vegetable crops)	Damping-off (RPD916) and seedlings blights; gray mold (RPD942) or botrytis blight	After planting apply captan, thiram, or zineb (1 T./gal.); ferbam or ziram (2 T./gal.)	Disinfest seedbed soil (Cir. 893), then apply seed treatment (RPD915). Then apply sprays or drenches after planting. Apply *only* if damping-off appears in seedbed and when seedlings need water. (*For crucifers, pepper, peas, beans, tomato, lettuce,* add PCNB to other fungicides to give broad-spectrum control.) Use at least 5 gal. per 1,000 sq. ft. of bed. Repeat at 5- to 7-day intervals when temperature is below 75° F.
	Root knot and other nematodes; fusarium wilts of various crops (RPD901,904,912,929, 954)	Heat or chemicals may be used. Consult Cir. 893 for names, general precautions, and directions	Disinfest seedbed soil (heat preferred, if available). Follow manufacturer's directions exactly. Fumigants work best in light, loose soils, free of trash, clods, and lumps. Avoid recontamination of treated soil. Best to apply fumigants during the fall that precedes planting. In general, soils must be at least 55° F. at the 6-inch depth with a time lapse of 21-28 days between treating and seeding. Some require gas-tight plastic covers.
	Root and stem crown rots of various crops (RPD902,911,922,923, 932,948,953)		
	Verticillium wilt (RPD950)		

RECORD SHEET FOR FUNGICIDE USERS

Date	Vegetable	Chemical	Dosage per acre	Remarks

8M—3-69—99723